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CHAPTER 25 THE ROLE OF GOVERNMENT IN PLANNING FOR DROUGHT: WHERE DO WE GO FROM HERE?

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CHAPTER 25
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INTRODUCTION

During the twentieth century, governments have typically responded to drought by providing emergency, short-term, and long-term assistance to distressed areas. Emergency and short-term assistance programs are often reactive, a kind of "band-aid" approach to more serious land and water management problems (Rosenberg, 1980; Hamer, 1985; Wilhite, et al., 1986). Actions of this type have long been criticized as inefficient and ineffective by the scientific community and government officials, as well as by recipients of relief. Long-term assistance programs are far fewer in number, but they are proactive. They attempt to lessen a region's vulnerability to drought through improved management and planning.

The vulnerability of developed and developing societies to drought has been reemphasized as a result of recent drought occurrences in Africa, Australia, Brazil, China, and the United States. These droughts have demonstrated the need for additional planning to help mitigate the possible worst effects of future droughts. The need for national drought planning exists in all drought-prone regions, as noted in the recent memorandum from the World Meteorological Organization (1986). Case studies of recent drought episodes, impacts, and governmental response in Botswana, northeast Brazil, and India are included in this section of the proceedings.

The purpose of this paper is to briefly review and evaluate the policies adopted by governments in response to recent episodes of severe drought. The mid-1970s droughts in the United States and Canada and the more recent droughts of the early 1980s in Australia and South Africa will be used as examples of prior drought mitigation efforts. Furthermore, recommendations will be made on how governments can improve drought mitigation efforts. The concept of drought policy and planning will be discussed in this context.

GOVERNMENTAL RESPONSE TO DROUGHT: U.S. AND CANADA

Droughts of the Mid-1970s

United States. Several episodes of widespread, severe drought have occurred in the United States during the past decade. The droughts of the mid-1970s, 1980, 1983,

1985, and 1986 are most noteworthy. Each of these recent droughts produced significant impacts and major economic losses. However, the mid-1970s droughts were the last episodes to result in massive response efforts by the federal government. This response effort culminated in 1977 after two or more consecutive years of drought in large sections of the Far West, northern Great Plains, and upper Midwest states.

The years 1974, 1976, and 1977 stand out as those in which the greatest economic losses occurred. Impacts were most critical in the agricultural sector, but the municipal, industrial, and recreational sectors were also affected. In 1974, the timing of the precipitation deficiency and heat wave resulted in reduced yields of corn and other grains, particularly in the central and southern plains states.

Weather conditions improved considerably during 1975, but drought returned in 1976 to many western states (Wagner, 1976). By May, the drought-affected area included all of California. By July, two pockets of extreme drought had developed. The first was in California and adjacent states. The second drought area extended from north central Nebraska through eastern South Dakota, southeastern North Dakota, and southern Minnesota to Wisconsin.

It became apparent by January 1977 that, because of below-normal snowpack in the Far West, irrigation water would be short the following summer. For example, precipitation deficits for the period October-February ranged from 125 mm to 510 mm in the Pacific Northwest (Dickson, 1977a). By April, moisture conditions improved in parts of South Dakota and the central plains while the drought intensified in Wisconsin and Minnesota (USDA, 1977). Drought conditions in the upper Midwest and West deteriorated further during April and May, and the total area affected expanded significantly. By the end of May, moderate to extreme drought affected the northern half of the eastern United States and most of the West as well.

Moisture shortages and high temperature conditions were moderating by August, but the spatial extent of drought had changed only slightly (Fig. 1). The situation had improved slowly by September, first in the Far West, central plains, and central Midwest, then in the northern plains. From December 1977 through March 1978, weather conditions improved considerably in the far western states. Precipitation was normal or above normal during the entire period, which considerably improved the water supply outlook for irrigation during the summer of 1978.

Canada. The drought that affected the Canadian prairie provinces of Alberta, Manitoba, and Saskatchewan during the 1976-77 period was largely an extension of a widespread drought that was occurring simultaneously in the United States. The drought began during the winter months of 1976-77. Precipitation during the period of September 1976 to April 1977 was 50% of normal in the southern portion of Saskatchewan and Manitoba and a small portion of Alberta. By April the region's moisture conditions were characterized by below-normal snowpack, low soil moisture reserves, and reduced streamflow and ground-water reserves. By the end of May, heavy precipitation throughout the region had alleviated the impending threat of widespread drought.

Drought Policy and Assistance Measures During the Mid-1970s

United States. Although many programs are now available to alleviate economic and physical hardship caused by natural disasters, only a few of these

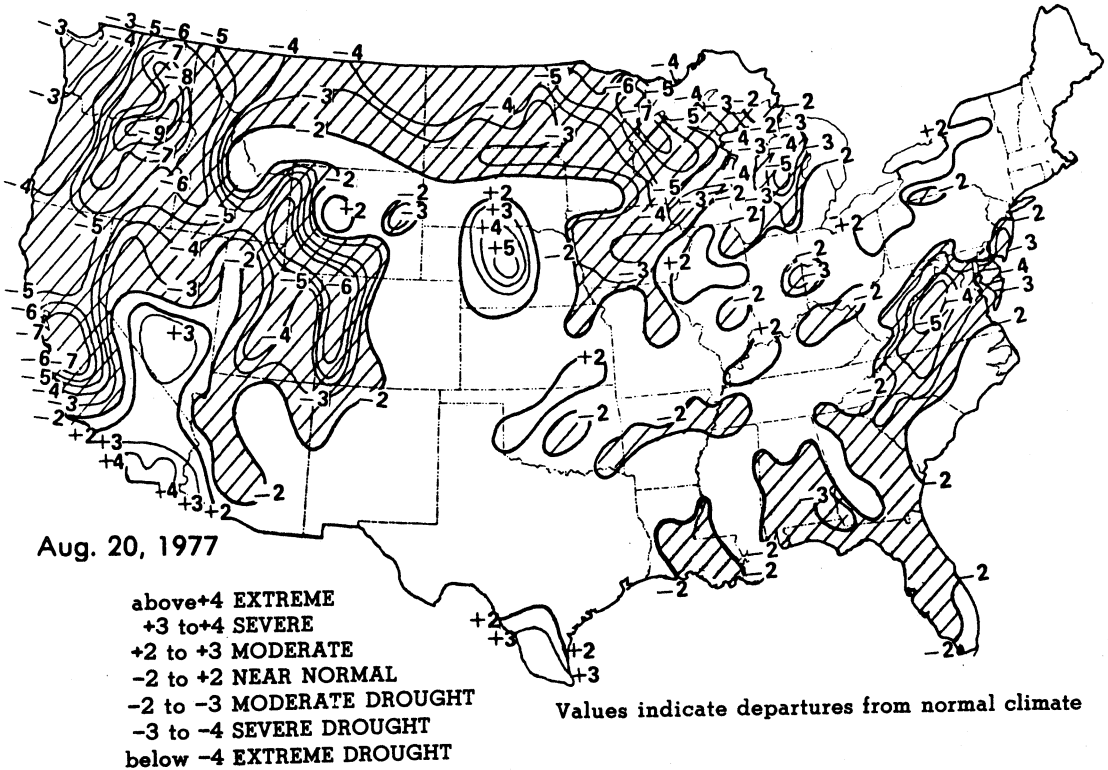

Fig. 1 Palmer Drought Severity Index values for the United States, August 20, 1977.

programs are designed specifically to cope with drought. The total funds allocated during 1974-77 to lessen the effects of the drought through various loan and grant programs, plus the costs of administering the programs, have been estimated at more than $8 billion (Wilhite, et al., 1986).

Seven programs accounted for the vast majority of funds disbursed during the mid-1970s drought. The most important of these was the Farmers Home Administration's (FmHA) Emergency Loan Program. This program provides credit assistance to established farmers, ranchers, and agricultural operators when a natural disaster causes physical damage to property or has resulted in severe crop production losses. Emergency loans are made in counties designated by the president as major or emergency disaster areas. Designations can also be made by the secretary of agriculture or the FmHA state director. After April 25, 1977, the Interagency Drought Coordinating Committee (IDCC) also triggered designations. During 1976-77 and the first eight months of FY1978, FmHA made more than 92,000 loans totaling $3.23billion (GAO, 1979).

A second major program of the mid-1970s was the Small Business Administration's (SBA) Disaster Loan Program. SBA was authorized to make loans as determined necessary and appropriate because of floods, riots or civil disorders, and other catastrophes. Crop production losses due to drought or other events were first included in SBA's program in June 1977, and loans were made available to farmers beginning in July 1977. Two types of loans were available through SBA: physical disaster loans and economic injury loans. Congress appropriated $1.4 billion for SBA to meet the demands of farmers (GAO, 1979).

The Agricultural Stabilization and Conservation Service (ASCS), a subagency of the United States Department of Agriculture, administered the Disaster Payments Program. Under this program, a farmer whose production was reduced by natural disaster to less than two-thirds of his historical average production became eligible for payment of one-third of the target price level (ASCS, 1976). The total amount disbursed nationally through this program between 1974 and 1977 was more than $1.8 billion (ASCS, 1974-77).

Other programs of significance during the mid-1970s drought were the Emergency Fund and Emergency Drought Programs of the Department of Interior, $130 million; the Community Emergency Drought Relief Program of the Department of Commerce, $175 million; and FmHA's Community Program Loans and Grants, $225 million (GAO, 1979).

States in the United States do not have fiscal or administrative responsibility for relief measures under conditions of drought or other natural disasters. Since the 1930s, this responsibility has been centralized with the federal government (Wilhite, 1983). Attempts have been made to initiate cost-sharing measures, such as during the 1950s drought, but these have been viewed with disfavor by state government (Wilhite, et al., 1984). State opposition to cost-sharing on drought assistance measures has been based on arguments of limited resources and/or the interstate inequity of available resources.

The mid-1970s federal and state response effort in the United States has been documented and evaluated elsewhere (GAO, 1979; Wilhite, et al., 1984). The latter study demonstrated that governments in the United States often respond to drought through crisis management rather than by risk management. This was true not only in the mid-1970s but also in previous episodes of widespread and severe drought. In crisis management the time to act is perceived by decision makers to be short. Reaction to

crisis often results in the implementation of hastily prepared assessment and response procedures that may lead to ineffective, poorly coordinated, and untimely response. The studies cited above suggest that if planning were initiated between periods of drought, the opportunity would exist to develop an organized response that might more effectively address issues and impacts specific to drought. Also, the limited resources available to government to mitigate the effects of drought might be allocated in a more beneficial manner.

Both of the studies cited above recommend the formulation of a national plan as a means of improving federal drought assessment and response activities. The components of a drought plan will be discussed later in this paper. Wilhite, et al. (1984), also recommend greater involvement by state government in drought planning to complement and facilitate the federal effort. To date, no formal action on these recommendations has taken place at the federal level. State planning efforts, largely in response to the mid-1970s and subsequent droughts, have been completed in Colorado, South Dakota, New York (Wilhite and Wood, 1985), and (most recently) Nebraska and South Carolina.

Canada. In response to the threat of significant impacts in the prairie provinces from the short-term drought of 1976-77, both the provincial and federal governments responded with emergency financial and technical aid programs. Assistance was made available for drilling farm and municipal wells, transporting livestock and feed, and constructing stock ponds.

Liverman (1980) evaluated governmental response to this short-term drought. She concluded that the organizational structure set up to deal with emergencies such as drought was ignored during the 1976-77 period. Instead, a hierarchy of new committees was established within the government. Another coordination problem occurred because the jurisdictional units administered by various governmental agencies had different boundaries. This resulted in poor coordination between agencies at various levels of government.

There was also considerable disagreement between key decision makers over what constitutes a drought. This led to disagreement and indecision over the need for action. Also, reliance on precipitation statistics to determine the severity of impacts resulted in poor assessments of probable impact. The lack of good information and the overpublicizing of the event by the media led to overreaction by government. In the final analysis the drought was of moderate severity and produced few negative impacts. Liverman (1980) concluded that in most cases drought assistance was not justified.

Droughts of the Early 1980s

Australia. The 1982-83 drought was confined primarily to eastern Australia (Fig. 2), but portions of this area had been experiencing less severe droughts for a number of years. South Australia and New South Wales, for example, had experienced drought in each year since 1976 and 1979, respectively (Reynolds, et al., 1983). Clearly, the droughts preceding 1982-83 increased the vulnerability of agricultural producers to added effects of severe drought.

The "official" drought in New South Wales began in May 1979, when eight of the fifty-eight Pastoral Protection Districts were drought declared. By January of 1980,

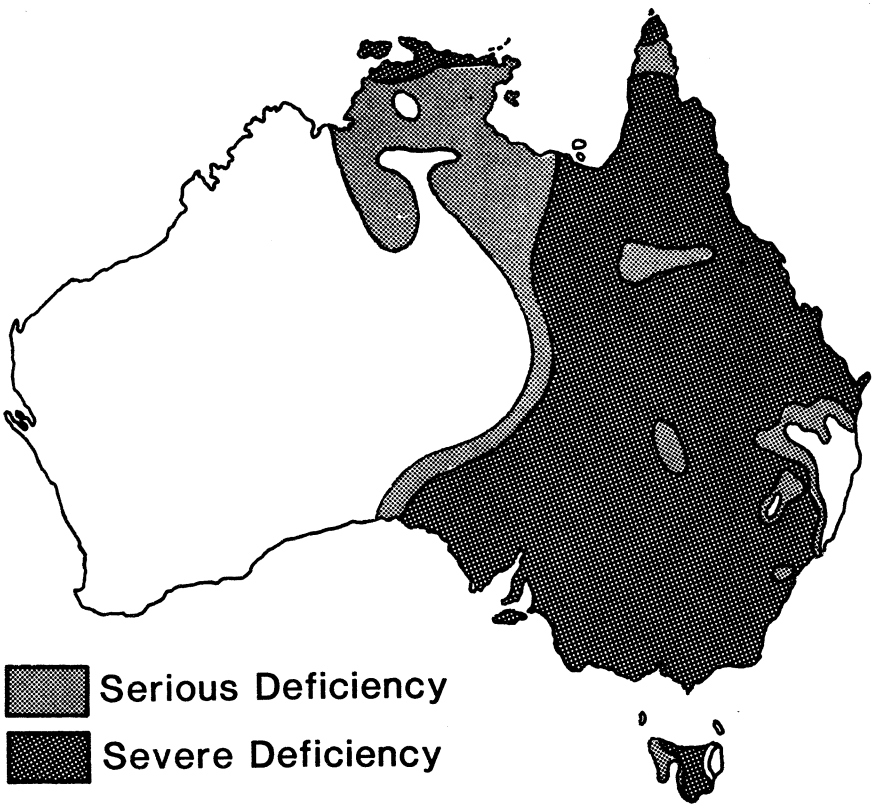

Fig. 2 Major drought-affected areas in Australia, 1983. The spatial extent of the drought was basically the same during 1982.

the rainfall situation had deteriorated still further and twenty-three districts were declared. Drought persisted but was of variable spatial extent and severity until August 1982, when a further rapid deterioration occurred. Between September 1982 and April 1983, more than fifty districts were drought declared. As a consequence of the drought, sheep numbers declined from a peak of about 73 million in the 1970s to about 43 million in 1983. Cattle numbers declined from a peak of 9 million in 1976 to about 4 million in 1983. The 1982-83 wheat crop was reduced from the normal 7 million to 1.5 million metric tons, for a loss of approximately A$825 million (New South Wales Department of Agriculture, 1983). The magnitude of the agricultural impacts in the other eastern states was similar to that in New South Wales. Over the entire country, farm debt increased by about 7%; in Victoria, the debt increased by almost 15%.

South Africa. Droughts are a normal feature of the climate of South Africa. In 1980 and the early months of 1981 the South African drought was mostly confined to the extreme southwest and northern parts of the country. During 1981 the drought area

spread eastward and southward. By early 1982 Palmer Drought Severity Index (PDSI) values were in the -2.0 (moderate drought) to -3.0 (severe drought) range for the central regions and -4.0 or less (extreme drought) in the extreme west and north. By mid-1983 the area of extreme drought had expanded significantly in spatial coverage; all but a small portion of the Transvaal was affected by at least moderate drought (Department of Agricultural Technical Services, 1980-83).

The drought resulted in severe hardships for farmers and also had a catastrophic impact on the nation's economy. South Africa, normally a major exporter of grains and other agricultural products, suddenly became an importer. Usually the world's third leading exporter of corn, South African imports in 1983 were expected to be about 2 million tons. Also, exports to neighboring states and to those in East and West Africa were significantly reduced as a direct result of the drought. This drought has not been confined to South Africa, but rather has affected a large portion of southern Africa. The impacts of and associated governmental responses to this drought in Botswana are the focus of a paper in these proceedings by T. C. Moremi.

Drought Policy and Assistance Measures of the Early 1980s

Australia. The Australian constitution does not delegate specific powers covering natural disaster relief to the federal government. These powers belong primarily to the states, which, as a result, have taken a more active role in drought response than state governments in the United States and elsewhere.

Before 1971, natural disaster relief and restoration was provided at a state's request by joint federal/state financing on a 1:1 cost-sharing basis. No limit was set on the level of funding that could be provided by the federal government. In 1971 the Natural Disaster Relief Arrangements (NDRA) were established, whereby states were expected to meet a certain base level or threshold of expenditures for disaster relief from their own resources (Department of Primary Industry, 1984). Disasters provided for in this arrangement are droughts, cyclones, storms, floods, and bushfires. These expenditure thresholds were set according to 1969-70 state budget receipts and, therefore, varied between states. The base levels were raised in 1978 and 1984 (National Drought Consultative Committee, 1984; Keating, 1984). Under the NDRA arrangements, the federal government agreed to provide full reimbursement of eligible expenditures after the thresholds for state expenditures on natural disasters were reached. The NDRA formalized, for the first time, joint federal-state natural disaster relief arrangements.

At the time of the establishment of NDRA, a special set of core measures (i.e., federal government-approved drought assistance measures) had evolved in each state on the basis of thirty years of government involvement in disaster relief. These measures were particularly relevant to the needs of each state because they had been designed by state government in response to its own disaster-related experiences.

Tables 1 and 2 provide data on state and federal expenditures for drought aid from 1970-71 to 1983-84 under the NDRA. The magnitude of state expenditures is significant, especially when compared to the limited financial responsibility of states in the United States. The total for all states was just over A$570 million. Of this total, approximately A$180 million was expended during 1982-83 and A$120 million was spent during 1983-84. Federal expenditures to the states for drought aid under the NDRA ar-

Table 1
Expenditures in Australian States Under Natural Disaster Relief Arrangements, By Type of Disaster, 1970-71 to 1983-84 (A$ Thousands) (National Drought Consultative Committee, 1984)

	DROUGHT							
	New South Wales	Victoria	Queens-land	South Australia	Western Australia	Tasmania	Northern Territory	TOTAL
1970-71	3,239	———	15,623	———	———	596	———	19,458
1971-72	458	———	3,143	———	———	———	———	3,601
1972-73	———	———	———	———	———	———	———	———
1973-74	987	———	———	———	———	———	———	987
1974-75	160	———	———	———	———	———	———	160
1975-76	———	———	———	———	———	———	———	———
1976-77	1,120	1,626	———	———	3,023	———	———	5,769
1977-78	2,620	1,228	2,785	13,580	17,999	———	———	38,212
1978-79	3,013	1,422	5,165	9,257	8,070	———	———	26,927
1979-80	———	———	2,208	2,225	12,560	———	———	16,993
1980-81	66,810	———	22,768	———	20,142	———	———	109,720
1981-82	31,018	———	9,608	———	5,081	295	———	46,002
1982-83	53,645	34,796	51,982	27,380	12,653	1,282	———	181,738
1983-84 (estimate)	21,500	8,100	63,300	4,600	22,100	1,900	———	121,500
Total	**184,570**	**47,172**	**176,582**	**57,042**	**101,628**	**4,073**	———	**571,067**

Table 2
Commonwealth of Australia Payments Under Natural Disaster Relief Arrangements, Estimated by Type of Disaster, 1970-71 To 1983-84 (A$ Thousands) (National Drought Consultative Committee, 1984)

	DROUGHT							
	New South Wales	Victoria	Queens-land	South Australia	Western Australia	Tasmania	Northern Territory	TOTAL
1970-71	450	———	13,632	———	———	16	———	14,098
1971-72	———	———	1,502	———	———	———	———	1,502
1972-73	———	———	46	———	———	———	———	46
1973-74	38	———	———	———	———	———	———	38
1974-75	114	———	———	———	———	———	———	114
1975-76	———	———	———	———	———	———	———	———
1976-77	779	716	———	———	2,134	———	———	3,629
1977-78	1,458	399	3,091	12,350	15,269	———	———	32,567
1978-79	743	173	2,942	5,430	6,036	———	———	15,324
1979-80	———	-229	1,224	-270	6,922	———	———	7,647
1980-81	42,447	———	14,780	-737	13,523	———	———	70,013
1981-82	14,554	———	5,162	———	2,239	267	———	22,222
1982-83	32,557	22,695	37,297	18,368	7,731	———	———	118,648
1983-84 (estimate)	11,800	4,600	45,300	4,300	15,300	600	———	81,900
Total	**104,940**	**28,354**	**124,976**	**39,441**	**69,154**	**883**	———	**367,748**

rangements (Table 2) were just under A$370 million, or about A$200 million less than the total state expenditures. The largest share of the assistance was provided to Queensland and New South Wales.

In addition to the cost-sharing measures described above, two federal drought assistance schemes were available during the 1982-83 drought. These were the Drought Relief Fodder Subsidy Scheme and the Drought Relief Interest Subsidy Scheme (National Drought Consultative Committee, 1984). The Fodder Subsidy Scheme provided a payment to drought-declared primary producers to help defray the cost of fodder for sheep and cattle. The administrative costs of this program were covered by the states. The amount of the subsidy was based on 50% of the price of feed wheat and the nutritive value of the fodder relative to wheat; Commonwealth expenditures under this program were about A$104 million during 1982-83 and A$18 million through February 1984.

The Drought Relief Interest Subsidy Scheme provided payments to eligible primary producers to cover all interest payments exceeding 12% per year. To be eligible, producers had to have been drought declared and could not have available financial assets in excess of 12% of the total farm debt. Expenditures for the program, not including administrative costs, were about A$3 million in 1982-83 and A$23 million through February 1984.

The Livestock and Grain Producers Association (LGPA) of New South Wales has strongly commended the state and federal governments of Australia for their drought assistance measures. LGPA based its conclusions on the achievement of what it considers to be the first priority of drought aid in Australia—the preservation of the national sheep and cattle herd. Through the preservation of these resources, farm and nonfarm income was able to recover more quickly than after previous episodes of severe drought. LGPA estimated that, had government not intervened in 1982-83, some 15 to 20 million sheep would have been slaughtered. As a result, post-drought recovery would have been delayed, at a cost to the national economy of A$500 million over a five-year period (Anonymous, 1983). However, the Working Group for the Standing Committee of the Australian Agricultural Council (1983) concluded, "With the exception of concessional finance and information, existing policy measures, including those introduced during the current (1982-83) drought, do not perform well in achieving the objectives of drought policy which it considered important. In summary, the nearly $300 million of expenditures was not cost effective."

These contrasting views of the cost effectiveness of recent drought measures in Australia reflect the recent controversy over state and federal involvement in drought aid. Several other studies have been completed (National Farm Federation, 1983; South Australian Department of Agriculture, 1983; Stott, 1983), each providing recommendations for future drought policy. The three Australian Academies of Science (1984) are also working together to try to resolve this issue. At stake is the role that government will play in attempting to alleviate or mitigate the hardship caused by drought and, possibly, other natural disasters as well.

The National Drought Consultative Committee (NDCC) was appointed by the Minister for Primary Industry in 1984 to review Australian drought policy. In a recent report (Ministry for Primary Industry, 1985) NDCC recommends two objectives for a national drought policy: (1) to encourage the efficient allocation of national and regional farm resources; and (2) to minimize the economic hardship caused by drought. In addition, the report identifies several specific national objectives and recommends drought

policy measures it considers to be the most effective. The committee also addressed issues concerning the administration, eligibility, and purpose of drought programs, as well as drought declaration and revocation procedures.

South Africa. Until recently, actions taken by the South African government in response to droughts typically have been poorly coordinated and assistance programs have been largely ineffective (personal communication from C. R. Baard, 1985). According to C. R. Baard, chief director of Regulatory Services of the Department of Agricultural Economics and Marketing in Pretoria, South Africa, the government has had difficulty assessing drought impact and making subsequent declarations, as have governments of most of the world's drought-prone regions. And, no routine comprehensive evaluation of government drought policy and response efforts has been completed.

For many decades, drought assistance programs in South Africa have concentrated largely on providing relief to the livestock industry, with little attention to crop farming, either dryland or irrigated. A similar situation has existed in Australia. The rationale behind this emphasis on the livestock industry in South Africa has been that 85% of all agricultural land in the country remains under native pastures, most of which lie in the dry zones of the western and northwestern part of the country. The incidence of drought (i.e., less than 70% of normal precipitation) in these drier zones is about one year in three. Only 15% of South Africa receives precipitation in excess of 500 mm per year.

The drought that began in 1978 has affected, to varying degrees, 75% of the country. Farmers in the crop regions of the Transvaal, Orange Free State, and Natal were hardest hit, as crops were destroyed in four consecutive years. Farmers in these states were unable to obtain credit from local cooperatives or commercial banks. Therefore, the government introduced new drought relief measures, such as debt consolidation loans through the Land Bank and Agricultural Credit Board. During the 1984-85 fiscal year the government spent approximately R447 million in support of these various drought relief programs (personal communication from C. R. Baard, 1985).

As a result of the extended drought period and the ineffectiveness of government drought programs, the South African government recently undertook a substantial reevaluation of their drought policy. The Phase Drought Relief Scheme, in effect since 1946, is now being gradually eliminated. This review of drought policy and programs has resulted in a clearer concept of what the objectives of drought relief policy should be. Assistance programs, the instruments of that policy, are being revised accordingly. The primary objective of the new drought relief strategy for the livestock regions of South Africa is to introduce measures that will ensure optimum utilization of the agricultural resources while avoiding detrimental effects on pasture lands.

DROUGHT POLICY COMPARISONS

A comparative analysis of drought policy in the United States and Australia during recent severe drought episodes has been completed and appears elsewhere (Wilhite, 1986). The results of this study will be presented here as examples of two approaches followed by governments to assess and respond to drought.

For purposes of comparison, the principal features of drought policy are grouped into three categories: organization, response, and evaluation (Table 3). *Or-*

Table 3
Comparison of Drought Policy Features: United States and Australia Status as of 1984

Features	United States	Australia
ORGANIZATION:		
National drought plan	None	Study in progress
State drought plans	In selected states	Through NDRA agreements
National drought early warning system	Joint USDA/NOAA Weather Facility	Bureau of Meteorology
Agricultural impact assessment techniques	Available, but generally unreliable	None available
Responsibility for drought declaration	Federal	State
Geographic unit of designation	County	Unit varies between states
Declaration procedures	Standard for all states, varies by program/agency	Varies between states; standard within states

RESPONSE:		
State fiscal responsibility for assistance measures	Negligible, if any	Defined by NDRA agreements up to base amounts, varies by state
State administrative responsibility for assistance measures	No responsibility for federal measures	Defined by NDRA agreements and by federal measures
Eligibility requirements and provisions of drought assistance measures	Standard within programs for all designated counties	Varies by state for NDRA core measures, standard for federal programs
National crop insurance program	All-risk federal program	Rainfall insurance feasibility study in progress
EVALUATION:		
Post-drought documentation and evaluation of procedures and measures	No routine evaluation by government	Routine evaluation by federal and state governments

ganizational features are planning activities that provide timely and reliable assessments, such as a drought early warning system; and procedures for a coordinated and efficient response, such as drought declaration and revocation. These characteristics would be the foundation of a national drought plan. Only a few states in the United States have drought plans (Wilhite and Wood, 1985). State drought plans exist only in a loose form in Australia under the NDRA agreements.

Response features refer to assistance measures and associated administrative procedures that are in place to assist individual citizens or businesses experiencing economic and physical hardship because of drought. Numerous assistance measures are available in the United States but few are intended specifically for drought. Relief arrangements in Australia are, for the most part, included under the NDRA agreements. An all-risk crop insurance program has been evolving in the United States since 1939 (Federal Crop Insurance Corporation, 1980). The Australian Bureau of Agricultural Economics has studied the feasibility of a rainfall insurance scheme and recommends the adoption of such a scheme under new drought policy guidelines. Hail and flood insurance is provided by commercial insurance companies in some areas.

Evaluation of organizational procedures and drought assistance measures in the post-drought recovery period is the third category of drought policy features. Governments in Australia have been more conscientious in their evaluation of recent drought response efforts. In the United States, government does not routinely evaluate the performance of response-related procedures or drought assistance measures. The General Accounting Office (1979) made an evaluation of the 1976-77 drought response activities at the request of the chairman of the Subcommittee on Environment, Energy, and Natural Resources, the late Congressman Leo J. Ryan. Wilhite, et al. (1984), evaluated governmental response to the mid-1970s drought under sponsorship of the National Science Foundation. These were the first systematic evaluations of federal drought response efforts in the United States.

THE OBJECTIVES OF DROUGHT POLICY

The underlying question is this: Should government be involved in providing assistance to those economic sectors or persons that experience hardship in times of drought? Because of the frequency, severity, and spatial extent of drought, governments in the United States, Canada, Australia, South Africa, and elsewhere have elected to provide assistance, and through a wide range of measures. These drought assistance measures are the instruments of a *de facto* policy that has evolved over the past fifty years. The decision on whether to provide aid has been based more often on political than economic reasoning. Thus, government involvement in drought relief seems to be a political reality, and one that should be dealt with in a more effective and efficient manner.

Previous discussion has concentrated on government response to recent episodes of widespread, severe drought in the United States, Canada, Australia, and South Africa. These drought relief attempts have been shown to be largely ineffective, poorly coordinated, and untimely. In these examples, governments have reacted to, rather than prepared for, recurrent and inevitable episodes of drought.

For purposes of contingency planning, the objectives of any government drought policy must be stated explicitly. Without clearly stated drought policy objectives, contingency planning will lack direction and purpose. Also, the effectiveness of drought assessment and response actions will be difficult to evaluate. In response to recent experiences, Australia and South Africa have begun stating drought policy objectives and formulating institutional plans and programs to carry out these objectives.

I propose three objectives for a national drought policy. First, assistance measures should not discourage agricultural producers, municipalities, and other groups from the adoption of appropriate and efficient management practices that help to alleviate the effects of drought. Second, assistance should be provided in an equitable, consistent, and predictable manner to all without regard to economic circumstances, industry, or geographic region. Third, the importance of protecting the natural and agricultural resource base must be recognized. Although these objectives may not be achievable in all cases, they do represent a model against which recent drought policies and measures, the instruments of that policy, can be evaluated. Drought policy objectives are also the foundation of any planning effort by federal and state governments.

DROUGHT PLANNING: WHAT IS IT?

Drought planning can be defined as actions taken by government, industry, individual citizens, and others in advance of drought for the purpose of mitigating some of the impacts associated with its occurrence. For purposes of this paper, drought planning should include, but is not limited to, the following activities:

1. A monitoring/early warning system to provide decision makers at all levels with information about the onset, continuation, and termination of drought conditions and their severity.
2. Operational assessment programs to determine, reliably, the likely impact of the drought event.
3. An institutional structure for coordinating governmental actions, including information flow within and between levels of government, and drought declaration and revocation criteria and procedures.
4. Appropriate drought assistance programs with predetermined eligibility and implementation criteria.
5. Financial resources to maintain operational programs and to initiate research required to support drought assessment and response activities.
6. Educational programs designed to promote the adoption of appropriate drought mitigation strategies among the various economic sectors most affected by drought.

DROUGHT POLICY/PLANNING RECOMMENDATIONS

For government in the United States to significantly improve its drought assessment and response capability, progress must be made in four key areas. The experiences of Australia, South Africa, and Canada have been similar to those of the United States,

suggesting that the following recommendations will be applicable in these countries as well.

1. Reliable and timely informational products. Reliable and timely informational products (advisories, reports, management recommendations) and information dissemination plans must be developed. For example, few can question the significance of more reliable and timely information about appropriate drought management strategies. Campbell (1973) has argued that Australian farmers have not exploited the available management strategies to their fullest. It would appear that this conclusion applies equally well to most farmers in drought-prone areas. Government or the private sector should provide information to producers, not only about the relative costs and benefits of alternative management strategies, but also about the probability of droughts of various duration and intensity. Such information could reduce drought impact as well as the need for government assistance. Government must also inform potential recipients more effectively about the availability and provisions of drought assistance measures.
2. Improved impact assessment techniques. Impact assessment techniques must be improved. In the case of agriculture, usually the first economic sector to experience the hardships of drought, new tools must be developed to provide decision makers in government and business with the types of information necessary to identify the onset and termination of drought and to better understand the severity of drought and its likely impact. These tools would be used by government to identify periods of abnormal risk and to trigger various assistance measures.
3. Centralized designation and revocation procedures. Designation procedures in the United States, for example, must be centralized under a single agency or committee with complete authority to determine eligibility for all assistance programs. Criteria must be determined in advance of drought, well publicized when drought occurs, and applied consistently to all affected states, counties, and localities. Revocation procedures must be similarly defined.

   Procedures for drought designation and revocation must be specific to each country, reflecting differences in the system of government, the relative importance of the various economic sectors, water supply and management characteristics, cultural differences, and so forth. In Australia, for example, the declaration of drought areas is a state responsibility, and procedures differ considerably between states. It may not be feasible to standardize procedures between the states because of the large precipitation gradients that exist over much of the country. In contrast, drought declaration decisions in the United States are a federal responsibility, considered at a state's request. Declaration procedures vary between agencies and, at times, between programs and within agencies. Drought policies with respect to revocation of declarations must be better defined and take into account the lingering effects of drought.
4. Adoption of a proactive approach to drought assistance program development. Assistance measures must be developed in advance of drought—that is, a proactive approach should be taken to avoid the delays in program for-

mulation and congressional approval such as occurred in the United States during the mid-1970s. Programs should be administered by a single agency through the mechanism of an interagency committee in which federal agencies with responsibility in drought assessment and response are represented. Representatives of the affected states and/or regions should be included in the membership of this committee. Assistance measures must address the specific problems associated with drought.

Another question deserving considerable attention in the discussion of national drought policy is the degree of fiscal and administrative responsibility that states should have in support of assistance measures. The Australian approach of cost-sharing these programs has been quite successful and may be applicable in the United States and elsewhere. Such an approach would allow states to have greater fiscal and administrative control over assistance measures. These measures could also be tailored to reflect the unique water supply problems and specific drought-related impacts of each state.

More attention should be directed to the development of assistance measures that encourage producers to incorporate appropriate levels of risk management in individual farm plans. Recipients of drought aid would benefit from knowing, in advance, what types of assistance will, and will not, be provided. Generally, Australians prefer assistance in the form of loans because recipients retain the flexibility to use the money in a way that best suits their farming situation; that is, farm management decisions remain with the farmer. Loans also have an important secondary effect: farmers can continue to spend at relatively normal levels and the economy of neighboring communities is not disturbed substantially. Equity requires that loans be made available to all. The Australian government has concluded that feed reserves and freight subsidies for water and feed can discourage the adoption of appropriate risk management techniques. These measures promote soil degradation by keeping livestock on the land during periods when the vegetation is severely stressed.

SUMMARY AND CONCLUSIONS

The purpose of this paper is to evaluate and compare current drought policy and government responses to recent droughts and to offer recommendations for policy change. The experiences of the United States, Canada, Australia, and South Africa were used as examples. Four critical needs were identified: (1) reliable and timely informational products and dissemination plans that provide producers with better information about drought, alternative management strategies, and assistance measures available; (2) improved impact assessment techniques, especially in the agricultural sector, for use by government to identify periods of abnormal risk and to trigger assistance measures; (3) administratively centralized drought declaration procedures that are well publicized and consistently applied; and (4) equitable, consistent, and predictable standby assistance measures that encourage producers to develop and maintain appropriate levels of risk management. These measures must not discriminate against good farm managers. Most of these recommendations will be applicable to drought policy and planning needs in developed and developing countries alike.

Governments in the United States have responded to drought by crisis management rather than risk management. This approach has been grossly ineffective. Several

recent studies have addressed the issue of drought policy, or lack of it, in the United States and have concluded that we should now move toward drought planning with the aim of improving its efficiency. The development of a national drought plan is proposed as an effective way of implementing these recommendations in the United States. In Australia, two national drought committees have considered the benefits of a national drought policy that would be the basis for a plan. A national drought policy, although only recently formulated, has now been adopted. Similar progress has been made in South Africa. Actions of this type have been called for in all drought-prone nations by the World Meteorological Organization (1986).

In the United States a national drought plan could encourage and perhaps provide incentive to states to take a more active role in planning for drought. In fact, drought planning should be coordinated between the states and federal government. In the past, most states have played a passive role, relying almost exclusively on the federal government to come to the assistance of residents of the drought-affected area. Although the federal government has accepted this role, improving government response to drought requires a cooperative effort. States must develop their own organizational plan for collecting, analyzing, and disseminating information on drought conditions. Cost-sharing of drought assistance measures should be pursued as a means of involving state government in drought assistance. The level of state involvement in drought planning in other countries must be determined on a case-by-case basis.

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